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(56) Documents Cited

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(54) Glazing bar and gasket for mounting infill panels

(57) The combination of a flexible gasket 22 and a glazing bar 2 are used to mount infill panels 12 of glass or other materials to building structures. The glazing bar has a channel 16 with internal gripping formations such as barbs 26 which accommodate a central web 18 of the gasket, the web having complementary external gripping formations, such as barbs 24. In an alternative embodiment, the glazing bar has a web and the gasket a channel. In either embodiment, the gasket has a pair of limbs 14 which seal against the adjacent edges of two panels. In a further embodiment (figure 5), the arrangement may be adapted to mount a panel to frame or edge member. The glazing bar also provides seals 10, which may be ridged, for the face of the panel opposite to the gasket limbs 14. The gasket 22 and seals 10 may be of a resilient rubberised material, for example silicone rubber, and the glazing bar may be extruded and may be of aluminium.

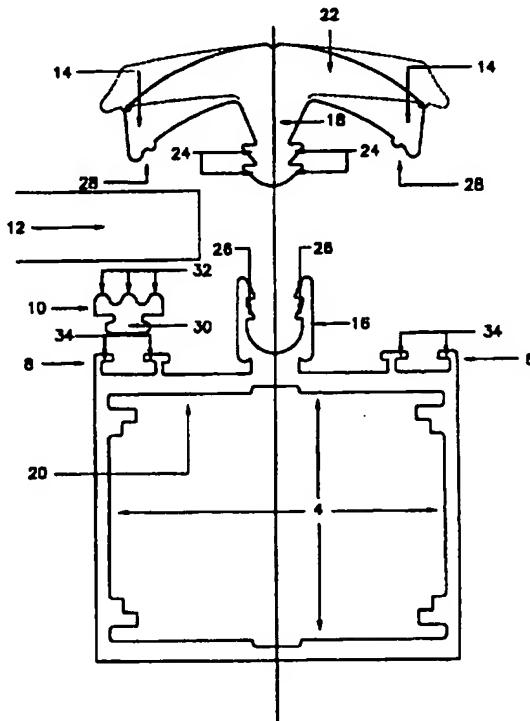


FIG 3

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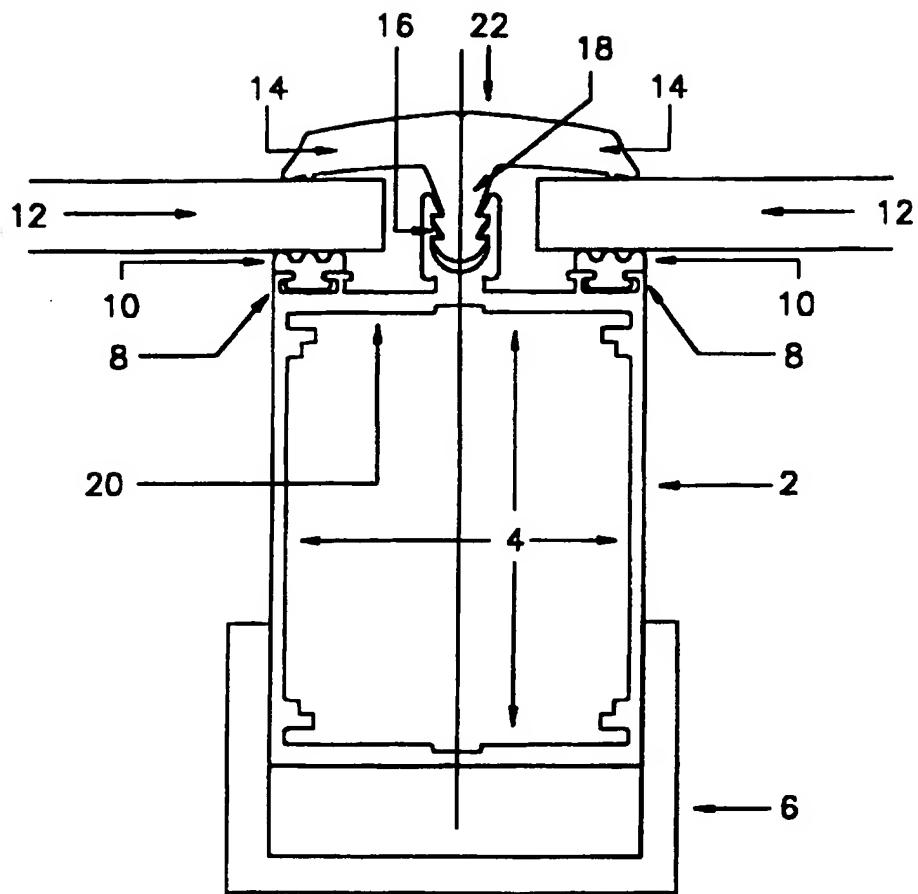


FIG 1

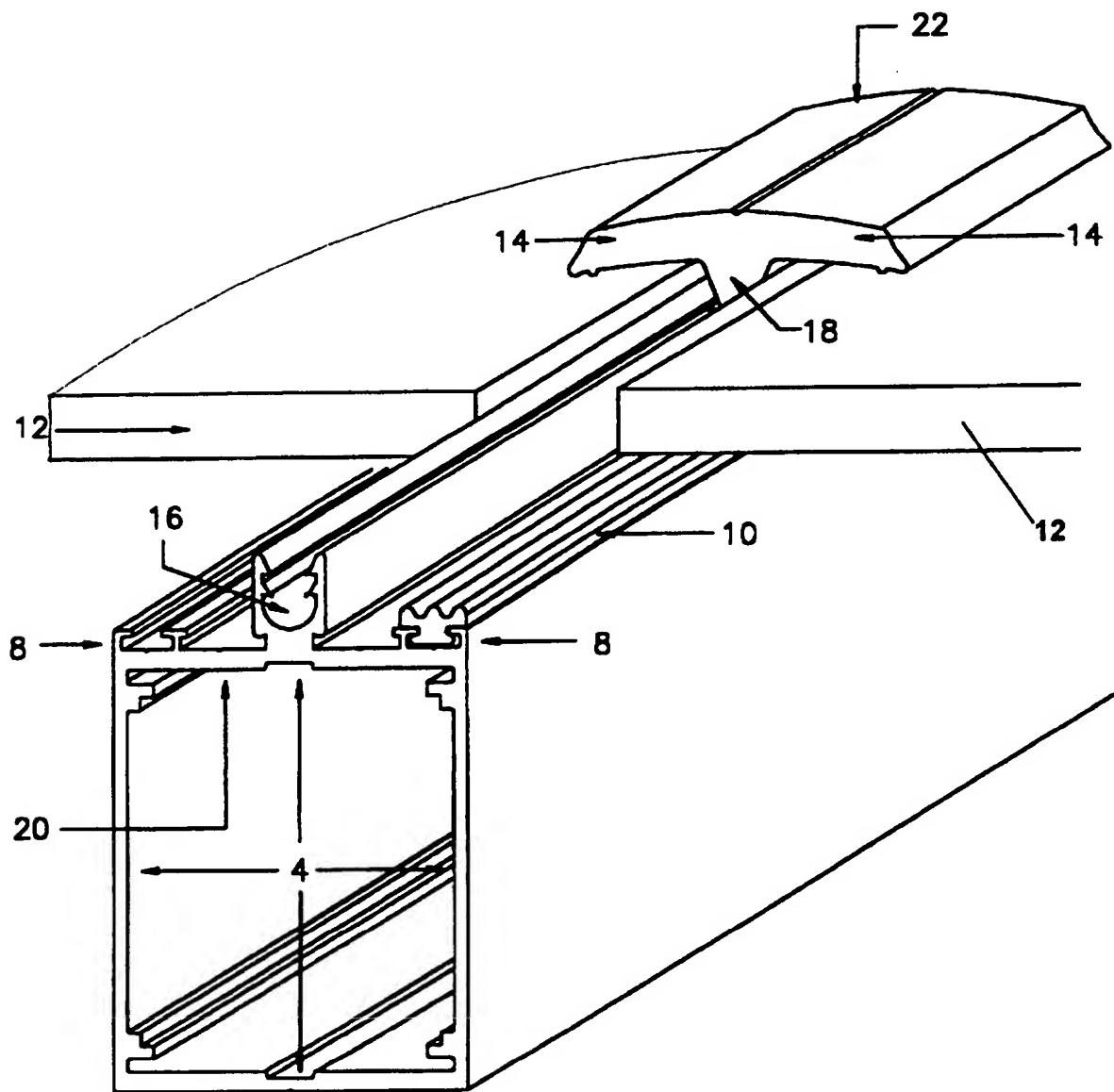


FIG 2

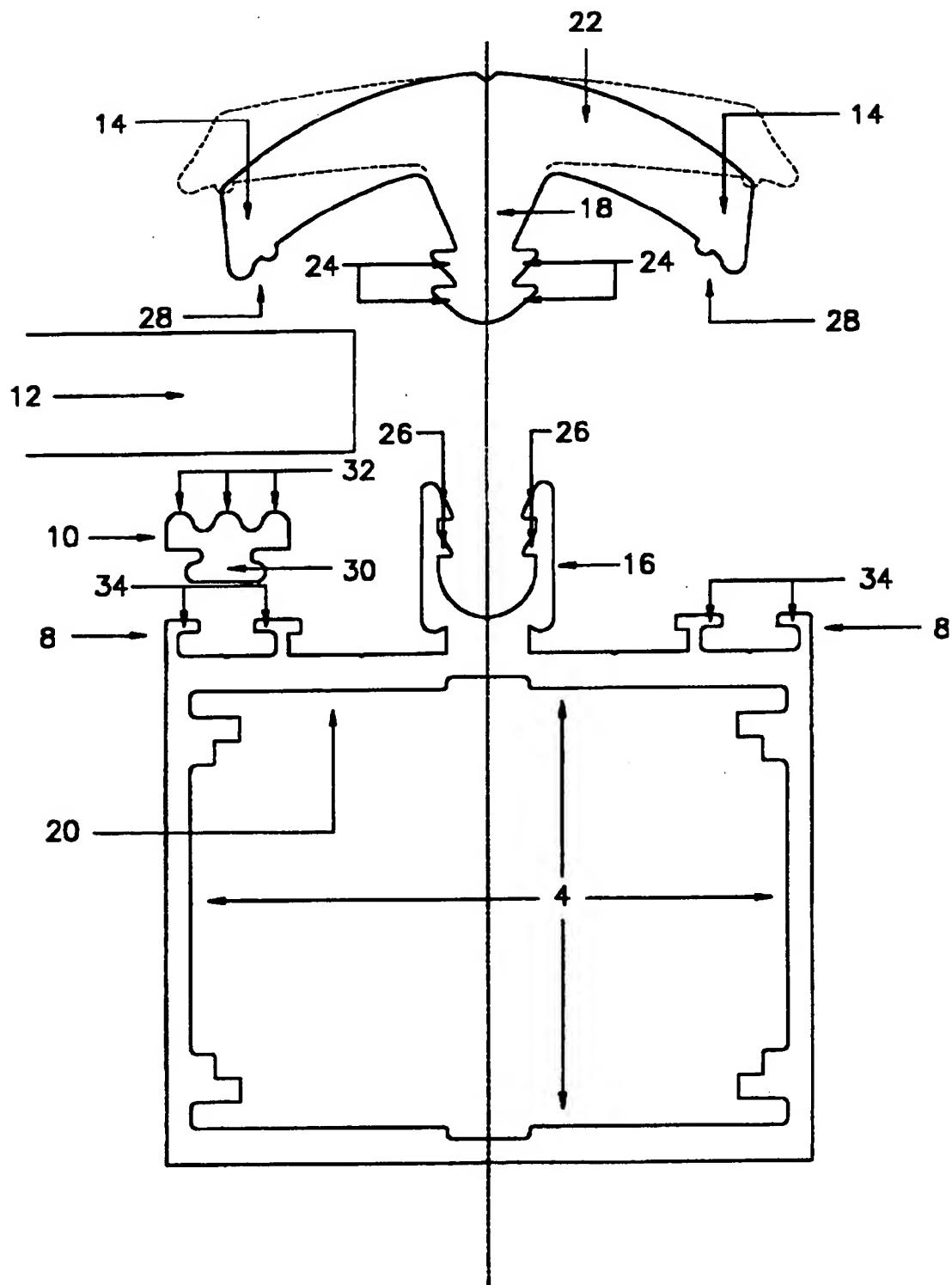


FIG 3

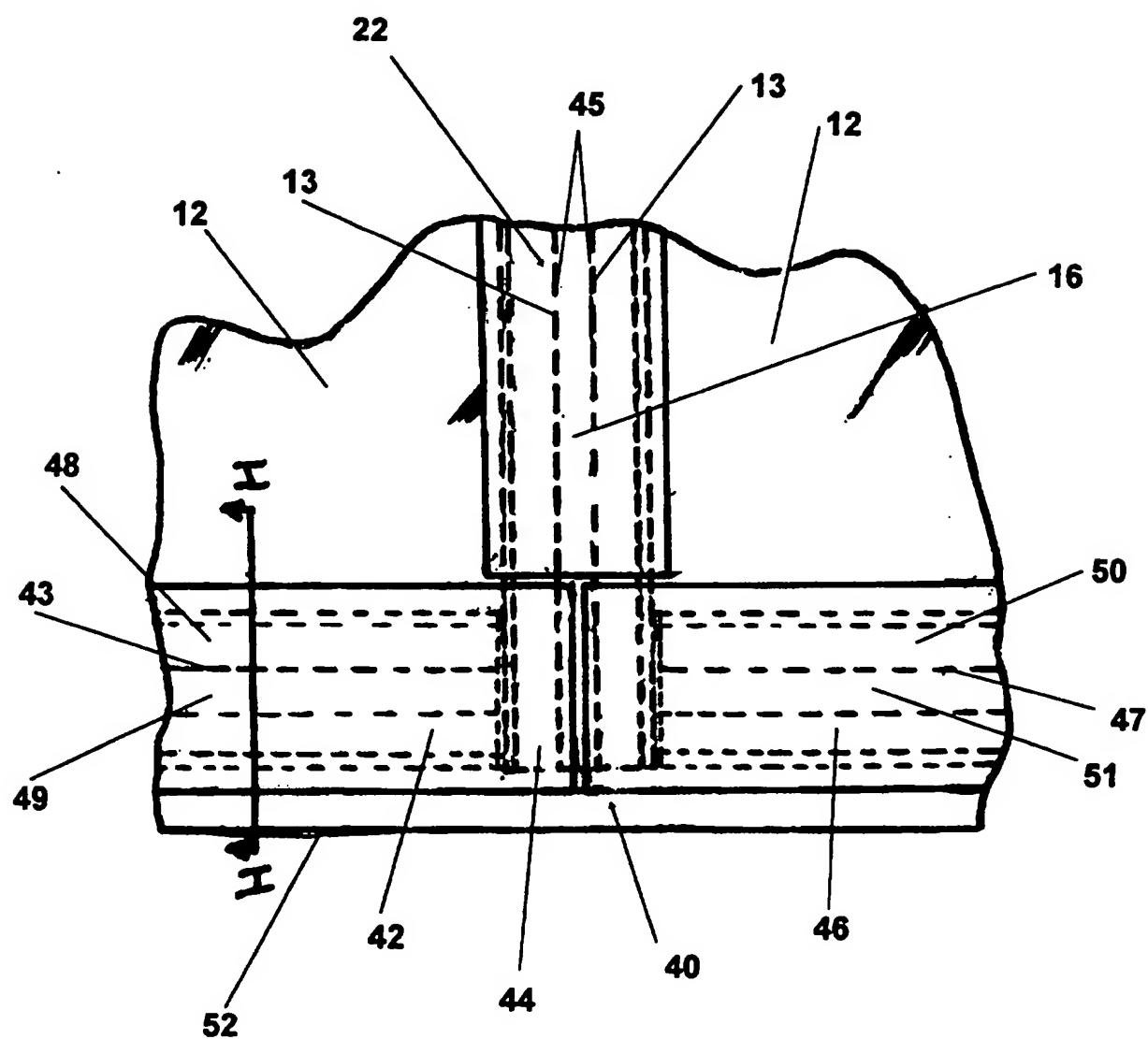


FIG 4

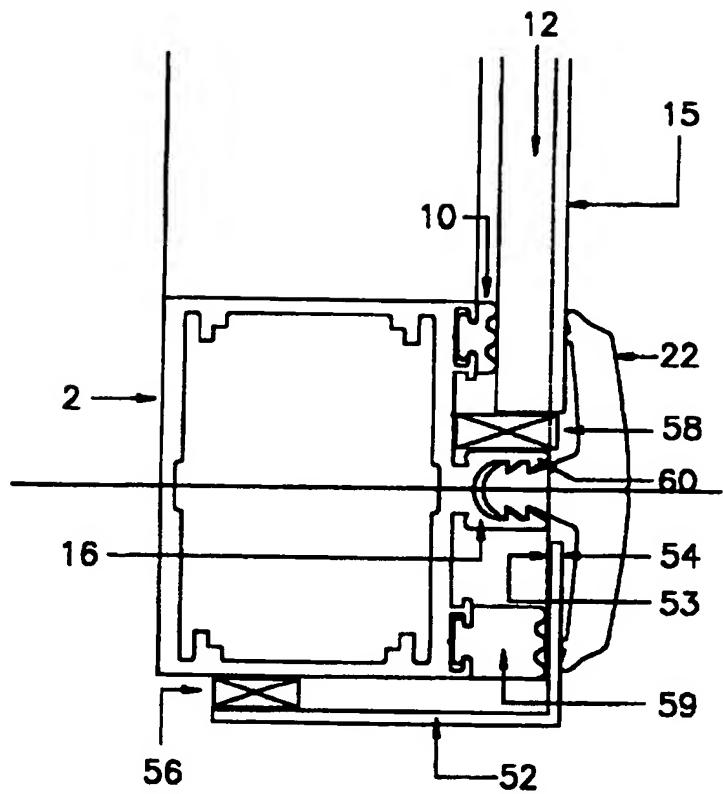


FIG 5

Improvements in Panel Support Systems

This invention relates to improvements in panel support systems, especially glazing panel systems, and in particular to improvements to glazing strips or gaskets which retain the glazing panels or infills and provide seals therebetween.

A proliferation of glazing systems exist whereby a panel of infill material is supported by a glazing bar which is usually attached to the structural steelwork or brickwork of a building, or other structures such as canopies, shelters, facades and the like. This glazing bar will in most circumstances have an arrangement of grooves or channels into which slot the glazing strips or gaskets which position the infill panel in the space defined by the surrounding glazing bars.

Such glazing bars and strips are normally extrudates, with the bars being manufactured of aluminium (previously utilised materials have been timber, plastic and other metals), and the glazing strips or gaskets are of a resilient elastomeric rubber type material, such as silicone rubber.

Glazing systems do not necessarily require that glass be the infill material. Such systems allow for a variety of infill panel materials such as aluminium, timber, perspex, the actual material being entirely dependent on the aesthetic or functional requirements of the building structure. Curtain walling and cladding of buildings are possible uses for such glazing systems wherein infill panels are of a material other than glass.

Within the prior art there exist a number of essentially similar systems for specific applications and having novelty features. G.B. Patent 1502967 describes the use of two glazing strips inserted in a

glazing bar with accommodating channels on opposing sides of the infill panel, said glazing strips having a resilient reinforcing member to enhance their flexural rigidity properties. The panel is supported only by these strips, and the glazing bar provides no supporting shoulder.

G.B. Patent 1458443 makes reference to sliding window frames into which a glazing strip may be inserted to support a single glass pane, and although a shoulder is provided to support the glass, the form of the glazing strip is specific to the above patent, and no mention is made of a glazing bar for attachment to structural building materials.

Relevant and recent developments in glazing systems have been documented in G.B. Patent 2023703. In this patent, infill panels are mounted on two shoulders of a glazing bar, and are sealed from the elements by means of a glazing strip or gasket inserted in a channel formed integrally with the glazing bar, and one side of which forms the shoulder on which the panel of infill material rests. The inwardly disposed face of said infill panel is supported by a sealing strip inserted in a channel distanced from the channel accommodating the glazing strips by a suitable amount.

Although glazing systems are comprehensively covered in the prior art, specific design of a glazing bar and an accompanying glazing strip or gasket can produce significant improvements in aesthetic appearance and waterproofing characteristics.

Previous glazing systems have utilised a double external gasket arrangement whereby two gaskets with saw-tooth or similar indentations on the external faces of their webs are inserted into a channel or individual channels in the glazing bar with corresponding indentations to hold these gaskets in place. A seal is then formed on

the opposing infill panels as the gasket flanges deform elastically against the opposing infill panels.

Such an arrangement has disadvantages in that water may seep between the mating gaskets, thermal efficiency is reduced, and component manufacturing time and expense is increased due to the duplicity of gaskets required.

The object of the present invention, at least in its preferred form, is to avoid these difficulties and provide a simpler means of attaching infill panels to a building structure.

According to the present invention there is provided the combination of a flexible gasket and a glazing bar which can be attached by suitable means to a building structure, said bar having formed therewith a channel, with first gripping means on the inner faces of said channel arranged to correspond with second and complimentary gripping means on the flexible gasket when inserted in the channel, said flexible gasket comprising a central web portion having said second gripping means, and two limbs extending outwards from said central web for resiliently holding the edges of respective infill panels on shoulders of said glazing bar to opposite sides of said channel.

The glazing bar may have in place of the said channel an outwardly facing web with gripping means on each side for engagement with complimentary gripping means on the inner surfaces of a channelled web of said flexible gasket; this represents a mechanical inversion from the preferred arrangement described above.

The inner faces of the infill panels preferably engage seal strips mounted in small channels formed with the glazing bar on the same

face of said glazing bar as the channel which accommodates the web of the flexible gasket as described above.

The said glazing bar may be extruded to provide a uniform cross-section, and will preferably be formed of aluminium.

The said gasket and seal strips may also be extruded, and may be formed of a suitable flexible resilient rubberised material, but will preferably be formed of extruded silicone rubber.

The surfaces of the gasket limbs contacting the panels of infill material may have double raised notches at the extremities of said limbs in order to form seals between said panels and gasket limbs. This seal is increased as the gasket is inserted into the central channel of the glazing bar with compressive flexing of the said limbs against the said panels, the limbs being substantially parallel with the panels on complete insertion of the gasket.

The surface of the glazing bar facing the panels of infill material may have grooves to provide seals on the said inner faces of the infill panels with seal strips mounted in said grooves, and these seal strips may be ridged on the faces which engage the infill panels to hold said panels more firmly than would be the case with a seal strip with a plane contact surface.

According to another aspect of the invention, there is provided an arrangement for mounting an infill which comprises a frame member having a shoulder to carry the infill and, adjacent the shoulder, a channel having means in its internal walls for engagement with corresponding means on the foot of a flexible gasket in the channel, the gasket having a limb extending above the shoulder to bear against the infill, the channel opening in a direction normal to the

plane of the infill, and means ensuring that the gasket contacting face of the infill is above the top of the shoulder.

The use of a single extruded gasket having the above features has the following advantages:

- (a) improved flexural rigidity due to the symmetrical flexing of the limbs, which results in an improved seal between gasket and infill panels;
- (b) improved waterproofing due to the fact that two gaskets (as in the prior art) are not required.

The displacing of the outer infill panel surfaces beyond the level of the top of the shoulders on which they are supported may result in an even better weatherproof external seal if the gasket is inserted fully into the channel, as the gasket limbs flexed further and thus bear on the surfaces on the infill panels with greater force.

A further advantage of this positioning of the panel outer surfaces above the tops of the said shoulders arises when the periphery of a framework of glazing bars and infill panels requires finishing.

Usually, the peripheral edge will be interrupted by supporting glazing bars at right angles to any non-supporting edge. Infill panels will be supported on the shoulders of these glazing bars within the peripheral edge and surrounded by non-supporting shoulders by glazing bars forming the majority of the periphery. Thus, the majority of the periphery may be simply finished by covering strips of a right-angled cross section attached in a similar manner to the infill panels. However, the upright channels of the supporting glazing bars would dispose the surface of such covering strips to project above the surface of the infill panels as the covering strips

would rest on the tops of these, whereas the infill panels are supported by the sides of these shoulders. Thus for flush fitting cover strips around a periphery, the shoulder tops require machining to reduce their height in order that a covering strip may sit with its upper surface flush with the infill panel adjacent it. If, as in the present invention, the surfaces of the infills are already disposed above the tops of the shoulders of the glazing bars, a covering strip of suitable thickness may rest on the tops of the said shoulders around the periphery of a section and yet remain flush with the infill panels.

A specific embodiment of the invention will now be described by way of example only with reference to the accompanying drawings, wherein:-

Fig. 1 shows a section through a glazing bar and gasket combination according to the invention, and infill panels;

Fig. 2 shows a broken away perspective view of the arrangement of Fig. 1;

Fig. 3 shows an exploded sectional view of the arrangement of Fig. 1;

Fig. 4 shows a front elevation of a portion of a glazing bar arrangement close to the periphery of a glazed section where three separate glazing bars intersect; and

Fig. 5 is a view of the arrangement in Fig. 4 along section I-I.

With reference to Fig. 1, a glazing bar 2 is attached by a support member 6 to a structural building member (not shown). The glazing bar 2 has sides 4, with an uppermost side 20 having channels 8 and

16 formed thereon. The channels 8 are adapted to receive and hold seal strips or backing gaskets 10 on which faces of infill panels 12 rest. On the upper faces of infill panels 12, limbs 14 of a gasket 22 resiliently bear, due to the engagement of a web 18 of the gasket 22 into the channel 16 in a manner to be described.

Referring to Fig. 3, the web 18 of the gasket 22 is formed with gripping barbs 24 which are on each side of said web 18 designed to engage barbs 26 on the inner faces of channel 16 as the web 18 is forced into channel 16. Channels 8 are formed with flanged portions 34 in order to grip a section 30 of the seal strips or backing gaskets 10. These seal strips in this embodiment of the invention are formed with raised notches 32 to provide a waterproof seal on the lower surfaces of the infill panels 12, and also to hold said infill panels in position.

Although it will be understood from the above that the various components of the embodiment of the invention are assembled, a brief summary will now be given.

The structure to be clad with infill panels has the appropriate number of glazing bars 2 mounted thereon, for example by means of the described support member 6. The sealing strips are forced into the channels 8 so that their grooved surfaces 32 are presented outwardly. Next, the infill panels 12 are appropriately positioned so that the edges of the infill panels rest on the grooved surfaces of the sealing strips 10, and finally, and simply, the gasket strips 22 are forced into position by pushing the central webs 18 into the appropriate channel 16. The barbs 24 engage the barbs 26 and prevent the webs 18 from springing outwardly and out of the channel 16. During the forcing of the central webs 18 into the channel 16, the limbs 14 of the gaskets 22 engage the upper surfaces of the edges of the infill panels 12, and with continued forcing of

the central webs 18 into the channel 16, so the limbs 14 start to flex towards a flattened condition as shown more particularly in Fig. 1. This flexing of the limbs has the effect of causing the limbs to bear firmly and resiliently onto the upper surfaces of the infill panels, holding same in position. To assist the sealing effect between the limbs 14 and the infill panels 12, to the undersides of the limbs 14 and at the extremities thereof, there are formed projecting ribs 28 which sealingly engage the outer surfaces of the infill panels 12.

It will be noted that by the above described design of the gaskets 22 and the method of insertion, assembly is quick and efficient and no additional fixing devices are necessary. The use of holding barbs ensures that the flexible sealing gasket 22 will not spring out of the channel 16 and the pushing into the channel 16 of the web 18 is the only fixing step which is necessary.

Referring to Fig. 4, three separate glazing bars, one 44 vertical and two 42, 46 horizontal intersect at a location 40 of the periphery of a glazed section of a building (not shown). Infill panels 12 are supported on shoulders 43, 47 of glazing bars 42, 46 respectively. (It is possible that between the shoulders 43, 47 and the infill panels 12 there is inserted a packing strip to ensure that the infill panel 12 fits exactly in the aperture formed by the four glazing bars which surround it, and such a packing strip 58 has been shown in Fig. 5 to illustrate the feature.)

The edges 13 of infill panels 12 abut the non-supporting edges 45 of the channel 16 of the vertical glazing bar 44, and a gasket 22 is inserted within channel 16 frictionally bearing against the infill panels 12, and is gripped by means hereinbefore described. Gaskets 48, 50 are inserted into channels 49, 51 in the horizontal glazing bars 42, 46 and abut each other in the intersection region 40. The gaskets 48, 50 have different web arrangements in this region to

allow their insertion into both channels 49, 51 and into half of channel 16 of the vertical glazing bar 44. (An alternative embodiment of the invention has a gasket block for insertion in the channels of the three intersecting members in the intersection area 40. Conventional gaskets are inserted into the channels of the three glazing bars extending away from the intersection area 40 in the manner hereinbefore described.) These gaskets are disposed to resiliently bear against the lower edges of the infill panels 12, and also against a right-angled section closer rail 52 used as a finishing strip (shown in both Figs. 4 and 5).

With reference to Fig. 5, the underside 53 of the rail 52 is supported by the end of channel 16 of the vertical glazing bar 44 which projects beyond the glazing gaskets 48, 50, and by other similar ends of channels of vertical glazing bars (not shown). The right-angled rail 52 may also be supported by packing blocks or the like at intermediate distances between such vertical glazing bars.

The right-angled rail 52 is shown attached to a glazing bar 2 by suitable means such as an elastomeric resin 56 or the like, and the surface 54 against which the flexible gasket 22 bears is maintained at the same level as the outer surface 15 of the infill panel 12. This is achieved by supporting the under surface 53 of the rail 52 with an enlarged seal strip 59.

This means for the accommodation of the rail 52 in the manner shown, it is not necessary to machine the top edge of the shoulder 16 back to the level shown as would be required if, as in some prior art arrangements, the top of the shoulder 16 is arranged to lie substantially level with the said surface 15, such is provided essentially for example in the invention subject of British Patent application 2023703B. This machining which is required to be effected in the case of the prior art referred to, constitutes a

considerable inconvenience and obviously increases costs. Furthermore, it leads to delays in the production and installation of the glazing arrangement.

It will be appreciated that methods of infill panel attachment other than those described above will be considered by a person skilled in the art, and modifications and variations may be made to the system described without exceeding the scope or departing from the spirit of the invention.

CLAIMS

1. The combination of a flexible gasket and a glazing bar to mount infill panels and which can be attached by suitable means to a building structure, said bar having formed therewith a channel, with first gripping means on the inner faces of said channel arranged to correspond with second and complimentary gripping means on the flexible gasket when inserted in the channel, characterised in that said flexible gasket comprises a central web portion having said second gripping means, and two limbs extending outwards from said central web for resiliently holding the edges of respective infill panels on shoulders of said glazing bar to opposite sides of said channel.
2. A glazing bar according to claim 1 characterised in that the glazing bar may have in place of the said channel an outwardly facing web with gripping means on each side for engagement with complimentary gripping means on the inner surfaces of a channelled web of said flexible gasket.
3. A glazing bar according to claims 1 or 2 characterised in that seal strips mounted in small channels formed with the glazing bar on the same face of said glazing bar as the channel or outwardly facing web engage the infill panels mounted on the glazing bar.
4. A glazing bar according to any of the preceding claims characterised in that the said glazing bar is extruded to provide a uniform cross-section.
5. A glazing bar according to any of the preceding claims characterised in that the glazing bar is formed of aluminium.

6. A gasket according to claim 1 characterised in that the said gasket is extruded in a suitable flexible resilient rubberised material.

7. A gasket according to claim 6 characterised in that the said gasket is formed of silicone rubber.

8. Seal strips according to claim 3 characterised in that the said seal strips are extruded in a suitable flexible resilient rubberised material.

7. Seal strips according to claim 4 characterised in that the said seal strips are formed of silicone rubber.

8. A gasket according to any of the preceding claims characterised in that the surfaces of the gasket limbs contacting the infill panels have double raised notches at the extremities of said limbs in order to form seals between said panels and said gasket limbs.

9. Seal strips according to any preceding claim characterised in that the said seal strips are ridged on the faces which engage the infill panels to hold said panels more firmly than would be the case with seal strips with plane contact surfaces.

10. An arrangement for mounting an infill panel which comprises a frame member having a shoulder to carry the infill panel and, adjacent the shoulder, a channel having means in its internal walls for engagement with corresponding means on the foot of a flexible gasket in the channel, the gasket having a limb extending above the shoulder to bear against the infill panel, the channel opening in a direction normal to the plane of the infill panel, and means ensuring that the gasket contacting face of the infill panel is above the top of the shoulder.



Application No: GB 9617328.1
Claims searched: 1-10

Examiner: John Rowlatt
Date of search: 7 November 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E1R: RF, RRH, RRK, RRV.

Int Cl (Ed.6): E04D: 3/06, 3/08, 3/14, 3/366, 3/38.
E06B: 3/58, 3/68.

Other: Online: World Patents Index, EDOC.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB2275958A	(ULTRAFRAME PLC) - see especially figures 1 & 5.	1, 3-10
X	GB2246386A	(ARIEL PLASTICS LTD) - whole document particularly relevant.	1, 3-9
X	GB2136487A	(THE BRITISH ALUMINIUM COMPANY) - see especially figures 3 & 4.	1, 3-10
X	GB2015630A	(ROHM GmbH) - see especially figure 4.	2-9
X	GB1600358A	(ALCAN ALUMINIUM (UK) LIMITED) - see especially figure 2.	1, 3-9
X	GB1350917A	(JONES) - see especially figure 1.	1, 3-9
X	GB1323625A	(DRAFTEX) - whole document relevant.	1, 3-10
X	EP0649969A1	(ALCAN FRANCE) - whole document relevant.	1, 3-10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



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Application No: GB 9617328.1
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Category	Identity of document and relevant passage		Relevant to claims
X	EP0244349A2	(DÄTWYLER AG) - see especially figure 1.	1, 3-9
X	EP0092078A2	(GEBHARDT) - see especially figures 3 & 4.	2-10
X	WO89/04408A1	(DÄTWYLER AG) - see especially figures 1 & 3.	1, 3-10

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Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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